

Lesotho College of Education
PHY 1402 S - B
Worksheet: Electromagnetic Induction and Faraday's Law

Introduction

The principles of electromagnetic induction are widely used in the generation of electricity and in transformers. This worksheet will help you learn the basic principles of electromagnetic induction, and how to increase/decrease the size of the **emf** produced.

Pre-requisite Knowledge

You need to understand the basic concepts of magnetism (magnetic fields, theory of magnetism, etc), induction, current electricity (electric current, potential difference, types of current, emf, resistance).

Activity

Click [here](http://phet.colorado.edu/sims/faraday/faraday_en.jnlp) to open the PhET generator, and go to "pick up" coil tab. If the link does not open, copy this link

http://phet.colorado.edu/sims/faraday/faraday_en.jnlp and paste it in the address bar of your web browser (internet explorer, chrome, etc).

➤ Electromagnetic Induction

1. a) Move the magnet and record what you observe on the bulb.
b) Move the coil and record what you observe on the bulb.
c) Let the magnet rest in the coil and record what you observe on the bulb.
d) Make a conclusion based on your observations.

➤ Faraday's Law

2. a) Repeat 1. a), and investigate the effect of changing each of the following
 - speed of the magnet
 - strength of the magnet
 - number of turns of the coil.
b) Repeat 1. b), and investigate the effect of changing each of the following
 - speed of the coil
 - strength of the magnet
 - number of turns of the coil.
c) Draw a conclusion based on your observations for 2 a) and 2 b).

Extended work

1. Apply what you have just learned but use the 'generator' instead of the 'pick up coil' in the same software. Discuss the advantages and disadvantages of using the 'generator' versus the 'pick up coil' tabs to demonstrate Faraday's Law.